

## CLAIMS

We claim:

- 1 1. A computer implemented method comprising:  
2 determining a PPPoE client to be multicast capable;  
3 determining a layer 2 multicast channel from a layer 3 multicast channel; and  
4 transmitting multicast traffic for the layer 2 multicast channel as PPPoE multicast  
5 traffic in a PPPoE multicast session to the PPPoE client.
- 1 2. The computer implemented method of claim 1 wherein the layer 2 multicast channel  
2 is an Ethernet MAC address and the layer 3 multicast channel is an IP address.
- 1 3. The computer implemented method of claim 1 wherein determining the PPPoE client  
2 to be multicast capable comprises receiving a session request message from the PPPoE client,  
3 the session request message including a tag indicating PPPoE multicast capability.
- 1 4. The computer implemented method of claim 1 wherein PPPoE multicast traffic  
2 identifies a PPPoE multicast session identifier and the layer 2 multicast channel.
- 1 5. The computer implemented method of claim 1 further comprising the PPPoE client  
2 listening for PPPoE multicast traffic on the layer 2 multicast channel.
- 1 6. The computer implemented method of claim 1 further comprising the PPPoE client  
2 decapsulating multicast traffic from PPPoE if the PPPoE client is listening on the layer 2  
3 multicast channel.

1 7. A computer implemented method comprising:  
2 translating a layer 3 multicast channel to a layer 2 multicast channel;  
3 receiving a multicast packet;  
4 encapsulating the multicast packet with a PPPoE encapsulation;  
5 indicating the layer 2 multicast channel in the PPPoE encapsulation;  
6 indicating a PPPoE multicast session identifier in the PPPoE encapsulation; and  
7 transmitting the encapsulated multicast packet.

1 8. The computer implemented method of claim 7 wherein the layer 2 multicast channel  
2 is an Ethernet Media Access Control address.

1 9. The computer implemented method of claim 7 wherein the layer 3 multicast channel  
2 is an Internet Protocol address.

1 10. The computer implemented method of claim 7 wherein the PPPoE multicast session  
2 identifier is a reserved PPPoE session identifier.

1 11. The computer implemented method of claim 7 wherein the multicast packet is a video  
2 packet.

1 12. The computer implemented method of claim 7 wherein the multicast packet is a  
2 collaboration application packet.

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1 13. A network element comprising:  
2 a control engine to host a PPPoE process and to translate a layer 3 multicast channel  
3 to a layer 2 multicast channel; and  
4 a forwarding engine coupled with the control engine, the control engine to receive a  
5 multicast packet encapsulated with a delivery protocol, to decapsulate the  
6 multicast packet from the delivery protocol encapsulation, to encapsulate the  
7 multicast packet in a PPPoE encapsulation, to indicate the layer 2 multicast  
8 channel in the PPPoE encapsulation, to indicate a PPPoE multicast session  
9 identifier in the PPPoE encapsulation, and to transmit the PPPoE encapsulated  
10 multicast packet.

11 14. The network element of claim 13 wherein the control engine comprises a set of one or  
12 more processors and a memory.

13 15. The network element of claim 13 wherein the forwarding engine comprises a set of  
14 one or more processors and a memory.

15 16. The network element of claim 13 wherein the delivery protocol is Asynchronous  
16 Transfer Mode.

17 17. An apparatus comprising:  
18 a network interface card to receive traffic and to listen for multicast traffic on a layer  
19 2 multicast channel;  
20 a PPPoE module coupled with the network interface card, the PPPoE module to  
21 indicate to the network interface card the layer 2 multicast channel, to receive

PPPoE encapsulated multicast traffic on the layer 2 multicast channel from the network interface card, to decapsulate multicast traffic from PPPoE; and a processor coupled with the PPPoE module, the processor to process multicast traffic decapsulated by the PPPoE module.

18. The apparatus of claim 17 wherein the layer 2 multicast channel is an Ethernet Media Access Control address.

19. The apparatus of claim 17 wherein multicast traffic is streaming video.

20. The apparatus of claim 17 wherein multicast traffic is traffic of a collaboration application.

21. A system comprising:

a network element to transmit notification of a multicast, to translate the multicast's layer 3 channel to a layer 2 channel, to decapsulate traffic of the multicast from a first delivery protocol, to encapsulate traffic of the multicast with PPPoE, to indicate a PPPoE multicast session identifier and the layer 2 channel in the multicast's PPPoE encapsulated traffic, to further encapsulate the multicast's PPPoE encapsulated traffic with a second delivery protocol, and to transmit the multicast's PPPoE encapsulated traffic;

a customer premise equipment (CPE) coupled with the network element, the CPE to decapsulate the multicast's PPPoE encapsulated traffic from the second delivery protocol and to transmit the multicast's PPPoE encapsulated traffic; and

13 a host coupled with the CPE, the host to receive the multicast's PPPoE encapsulated  
14 traffic, to determine if the host is listening for the layer 2 channel indicated in  
15 the multicast's PPPoE encapsulated traffic, and to decapsulate the multicast's  
16 traffic from PPPoE if the host is listening on the indicated layer 2 channel.

1 22. The system of claim 21 wherein the multicast is a streaming video.

1 23. The system of claim 21 wherein the multicast is a collaboration application.

24. The system of claim 21 wherein the layer 2 channel is an Ethernet Media Access  
Control address.

25. The system of claim 21 wherein the layer 3 channel is an Internet Protocol address.

26. The system of claim 21 wherein the PPPoE session identifier is a reserved PPPoE  
session identifier.

27. The system of claim 21 further comprising a bridge coupled with the network  
element, the bridge to receive the multicast's PPPoE encapsulated traffic further encapsulated  
with the second delivery protocol and to transmit the multicast's PPPoE encapsulated traffic  
further encapsulated with the second delivery protocol to the CPE.

28. A machine-readable medium that provides instructions, which when executed by a set  
of one or more processors, cause said set of processors to perform operations comprising:  
requesting a PPPoE session;

transmitting an indication of PPPoE multicast capability;  
receiving notification of a layer 3 multicast channel for a multicast;  
generating a layer 2 multicast channel from the layer 3 multicast channel;  
receiving a packet of the multicast, the packet having a PPPoE encapsulation;  
if the PPPoE encapsulation indicates a PPPoE multicast session, then determining if  
the PPPoE encapsulation indicates the layer 2 multicast channel;  
decapsulating the packet from the PPPoE encapsulation if the PPPoE encapsulation  
indicates the layer 2 multicast channel; and  
discarding the packet if the PPPoE encapsulation does not indicate the layer 2  
multicast channel.

29. The machine-readable medium of claim 28 wherein requesting the PPPoE session  
comprises transmitting a PADR message to an access concentrator.

30. The machine-readable medium of claim 28 wherein the indication of PPPoE multicast  
capability is a tag in a PADR.

31. The machine-readable medium of claim 28 wherein the PPPoE multicast session is  
identified by a reserved PPPoE session identifier.

32. The machine-readable medium of claim 28 wherein the multicast is streaming audio.

33. The machine-readable medium of claim 28 wherein the multicast is streaming data for  
a ticker.

1 34. A machine-readable medium that provides instructions, which when executed by a set  
2 of one or more processors, cause said set of processors to perform operations comprising:  
3 generating a layer 2 multicast channel from a layer 3 multicast channel;  
4 receiving a multicast packet for the layer 3 multicast channel;  
5 encapsulating the multicast packet with a PPPoE encapsulation;  
6 indicating in the PPPoE encapsulation the layer 2 multicast channel and a PPPoE  
7 multicast session identifier; and  
8 transmitting the PPPoE encapsulated multicast packet.

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2 35. The machine-readable medium of claim 34 wherein the layer 2 multicast channel is an  
Ethernet Media Access Control address.

1 36. The machine-readable medium of claim 34 wherein the layer 3 multicast channel is an  
2 Internet Protocol address.

1 37. The machine-readable medium of claim 34 wherein the PPPoE multicast session  
2 identifier is a reserved PPPoE session identifier.